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SEARCH AT THE WEEKLY MARKETS FOR DETECTION OF SMALLPOX OUTBREAKS WHICH OCCURRED DURING PREVIOUS YEARS

by

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Introduction

The rural population of many Indian states has an age-old ingrained habit of meeting together, once a week, at a particular village, in order to exchange views and news, to sell the products of their fields and to buy household commodities. These places of gathering are called Weekly Markets and they are places where there is a concentration of information on all subjects concerning the villages from which people attend the market. Among other routine affairs, the health problems in their relatives' families are important subjects for discussion.

The use of weekly markets for the collection of rumours concerning the spread of smallpox has been repeatedly stressed since the intensified smallpox eradication programme began in India in 1973.[1,5]

Previous studies in Assam and Meghalaya[2,6,7] have shown that 10-12% of a rural population (i.e. up to 30% of families) in any block may be represented at the major markets at some time during the 7-10 days of the study. A team of searchers, on average one searcher per 500 market visitors, was able to inquire about the presence in their villages of diseases with skin manifestations from 40% to 75% of markets' attendants. The number of patients with rash and fever detected at the markets was matched with those found during the same time in the surrounding blocks by means of house to house visits.

Surveillance conducted at the weekly markets of Chaibasa, Bihar in December 1974 had revealed 19 of the 23 villages known to be affected by smallpox at that time.[4] Apart from the known active outbreaks, 32 smallpox outbreaks, dying out within the previous six months, were reported to the surveillance workers.

One of the advantages of a market search is that a large area may be surveyed within a short time and fairly reliable information may be obtained.

To confirm an area as smallpox free, it is necessary to prove the absence of smallpox in the last two years. In order to analyse how searching at weekly markets may be utilized in order to detect disease spread during recent years, the present study was carried out in the Garo Hills district of Meghalaya State, India.

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Material and methods

The Garo Hills district is mainly mountainous. The hills slope down towards the Brahmaputra valley, part of which lies within the territory of the district. The population of this plain, along with that living in several adjacent low hills, was the major victim of smallpox occurring in the district during 1973-74.

Administratively, the area belongs to Selsella, Zikzak and Betasing blocks bordering Goalpara district of Assam and Mymensingh district of Bangladesh (see map). The density of population, 57 per square kilometre, is almost twice as great as that of the rest of the district (26 per square kilometre), and the villages are more compact. Communication is also better than in the hills. Garo Tribals constitute the majority of the district population, while it becomes more mixed with Muslims towards the west. The latter are Bengali speaking, often with relatives across the border in Assam and Bangladesh. These relationships guarantee frequent movement to and from Goalpara, and during past years to Mymensingh district.

Medical institutions are represented by a public health centre and two dispensaries in Selsella block and by three state dispensaries in Zikzak and Betasing blocks.

According to documents available at the District Health Office, the first smallpox outbreak[a] reported, occurred in June 1973 in a village of Selsella block. In November two more importations arrived in the same block and one went to Zikzak block. Later, smallpox spread to other villages of the blocks and to Tura town (District Headquarters). Altogether 54 villages and mohallas of the district were affected by smallpox during 1973-74, of which 13 were in Zikzak, 27 in Selsella and 5 in Betasing blocks. Containment activities started in 1974 interrupted transmission and reduced the number of affected villages to 13, of which 4, 4 and 5 respectively were in the above blocks. By April 1975 the disease was totally eliminated from the district. As there was such a large number of outbreaks in these three contiguous blocks during three successive years, this area was selected for study.

Out of the 10 markets in the three blocks, the seven largest, situated in the villages approachable by public buses and attended by 1000 or more people, were selected for the search (see map).

While selecting the searchers, the point was considered that the local staff of PHC or dispensary would possibly know about the smallpox outbreaks occurring in their blocks during previous years. Therefore, only vaccinators transferred to a particular block after January 1976 were involved in the search. The rest of the searchers (leprosy staff) were the workers not working in the Smallpox Eradication Programme at the time nor who had worked in the block for the last four years, plus a number of hired workers. The searchers were not informed of the past smallpox history in the blocks. Four to 11 workers and supervisors were involved in the search at each market for a total of 53 man-days.

In general the same method of planning, publicity and inquiry as in the previous study[7] was utilized. Questions were confined only to the existence of smallpox, at present or in the past. The visitors were requested to recollect whether they had seen or knew about the disease during the past three years. Positive replies and the names of reporters were recorded. The names of the villages from which all the people questioned originated were also documented by the searchers. The search was carried out once at each market under the supervision of the WHO Epidemiologist.

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[a] The operational definition of a smallpox outbreak as used here and later is "any village or mohalla with one or more smallpox cases in the past six weeks".

Results

Out of a total of 695 villages in the area, people from 474 villages (68.2%) were questioned at the markets. Another 22 and 118 villages were represented respectively by people from other blocks of the district and from Goalpara district of Assam (Table 1).

Market visitors gave information about 64 villages affected by smallpox during the past three years. Out of these, two outbreaks pertained to 1970. Of the remaining 62 outbreaks 52 had been notified and recorded by the district authorities previously, of which 34 were in the Garo Hills district and 18 in Goalpara district, Assam.

One village was reported twice under different names. The remaining 10 villages possessing names which could not be found in the district list of known outbreaks were visited by supervisors for verification. Two reports turned out to be chickenpox outbreaks in 1975, while residents of the other eight villages, reported as affected, could give no definite history of pox disease in the past three years.

Of those reporting cases in villages in the Garo Hills district, 24 (71%) were actual residents of the villages from which they reported smallpox.

Discussion

Fifty-eight villages of the selected area of Garo Hills district had been affected by smallpox during years 1973-75. An active search at weekly markets situated in the three affected blocks was able to detect 34 of them, i.e. 58.6%. The ratio of affected villages reported by the market visitors to all known affected villages significantly increases from 30.8% for outbreaks occurring in 1973 to 100% for those occurring in 1975 (Table 2). The majority of the outbreaks were reported by residents of the same village, in some cases by members of the affected family. Several unreported outbreaks had occurred in villages not represented at the markets during this study. Ignorance of the disease in these villages among people from other affected villages shows that knowledge of the occurrence of the disease sharply decreases with an increase in time. Awareness should be better among residents of mountainous areas where smallpox is an episode of greater rarity.

As far as the plain areas are concerned, market search results cannot difinitely prove the absence of the disease during the past two years. Nevertheless, it is a suitable surveillance tool to indicate in a short time an area for more precise study, using such methods as a pock mark survey.

During a scar survey conducted in Thailand[3], a sample of 7000 children aged one to four years out of the total 34.56 million population of the country was selected for investigation. The sample was calculated on the basis of an expectation of 18% positive results, with a level of confidence of 95%. To confirm "Zero Smallpox" for some period, with the same level of confidence, the size of the sample would need to be very close to the size of the total group selected for investigation. With limited manpower and in a short period it is not possible to survey such a large sample in order to confirm that such a vast country as India is, indeed, smallpox free.

In such a case, a preliminary survey at the weekly markets may indicate the "vulnerable" areas where the chance is greater of finding persons with pock marks left by smallpox in recent years.

Summary

An active search at weekly markets has been tried as a possible way of detecting smallpox occurrence during the recent years. Three blocks of Garo Hills district, Meghalaya State, situated between Garo Hills and the Brahmaputra river were selected for the trial. Fifty-eight villages of the area had experienced smallpox during 1973 to 1975. Four to 11 searchers

(total 53 man-days) inquired among visitors at seven out of the 10 markets of the three blocks during April 1976. The search was able to disclose all the 13 outbreaks which occurred in the area in 1975 and 17 of the 32 outbreaks in 1974. The trial results showed that the market survey itself is not able to assure absence of the disease during the previous two years. However, taking into consideration the valuable information which can be obtained from a large area within a relatively short time, surveillance at the markets may be recommended as a preliminary step in indicating those areas where implementation of more precise surveillance methods is needed.

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TABLE 1. CATCHMENT AREAS OF THE SEVEN MARKETS SEARCHED

Location of the market	Block	No. of villages in the block	No. of villages from which people were questioned at the markets				
			Selsella Block	Betasing Block	Zikzak Block	Other blocks of Garo Hills District	Goalpara District villages
Kalaipara	Zikzak	165	0	5	67	0	2
Mahendraganj	Zikzak		0	0	17	0	0
Kalaichur	Zikzak		0	2	41	1	7
Ampathi	Betasing	220	0	74	80	2	7
Rajabala	Selsella	310	130	0	0	4	10
Garobada	Selsella		59	95	4	16	42
Piplebari	Selsella		70	2	1	3	60
Total[a]		695	200[a]	148[a]	126[a]	22	118

[a] In total, each village is counted once, though some villages were represented at two of three markets.

TABLE 2. RESULTS OF WEEKLY MARKET SEARCH FOR SMALLPOX OUTBREAKS IN PAST YEARS IN THE BORDER BLOCKS OF GARO HILLS DISTRICT. OUTBREAKS ARE RECORDED BY DATE OF ONSET OF THE FIRST CASE, NOT BY DATE OF DETECTION OF THE OUTBREAK

Year	1973	1974	1975	Total
Smallpox outbreaks reported during the year to the district authorities	13	32	13	58
Smallpox outbreaks detected at weekly markets	4	17	13	34
Percentage of outbreaks detected at weekly markets	30.8%	53.1%	100%	58.6%

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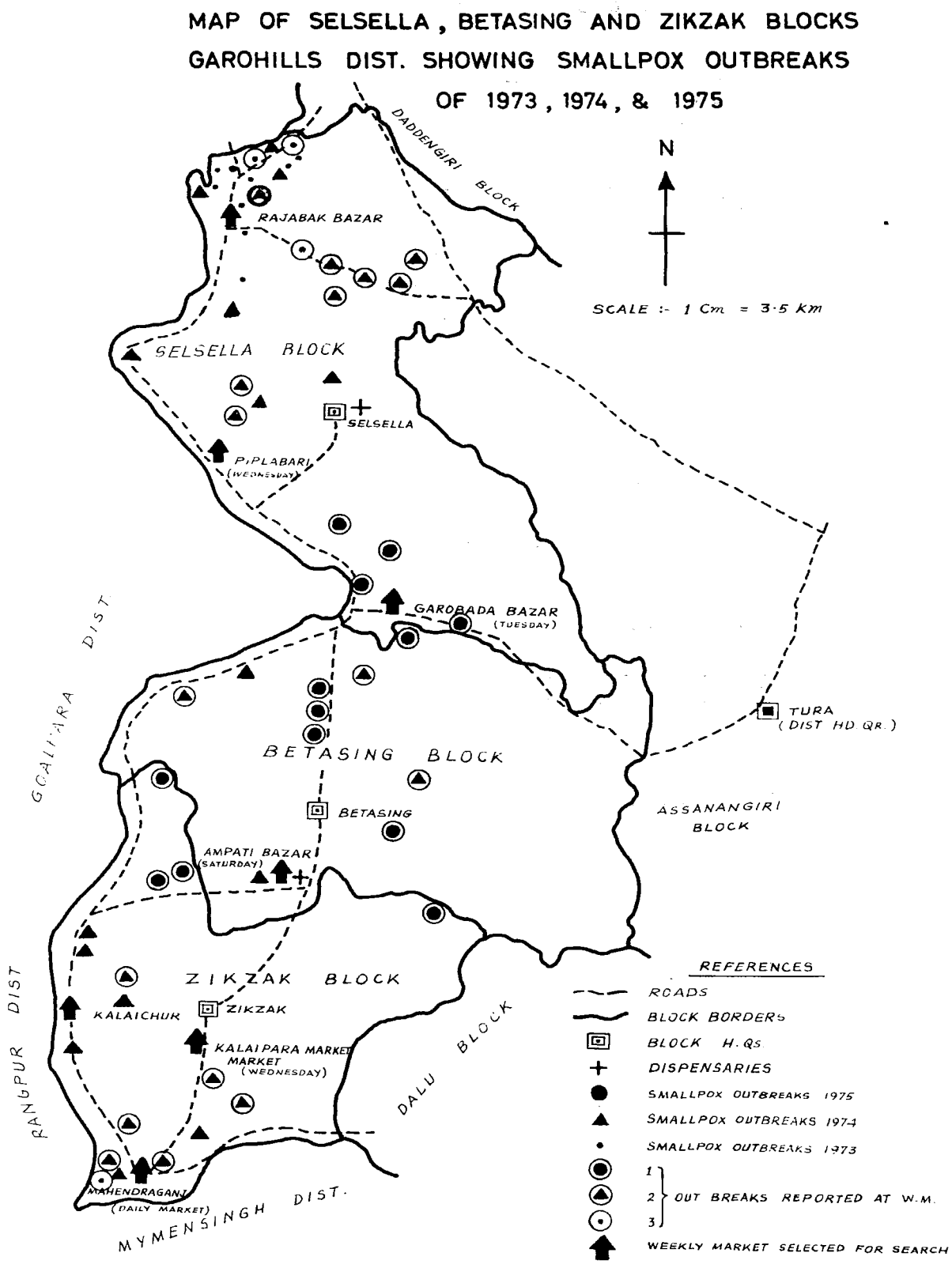
MAP OF SELSELLA, BETASING AND ZIKZAK BLOCKS
GAROHILLS DIST. SHOWING SMALLPOX OUTBREAKS
OF 1973, 1974, & 1975
N
SCALE :- 1 Cm = 3·5 km
DADDENGIRI BLOCK
RAJABAK BAZAR
SELSELLA BLOCK
SELSELLA
PIPLABARI (WEDNESDAY)
GAROBADA BAZAR (TUESDAY)
GOALPARA DIST
TURA (DIST HD QR.)
BETASING BLOCK
BETASING
ASSANANGIRI BLOCK
AMPATI BAZAR (SATURDAY)
ZIKZAK BLOCK
KALAICHUR
ZIKZAK
KALAIPARA MARKET (WEDNESDAY)
RANGPUR DIST
DALU BLOCK
MAHENDRAGANJ (DAILY MARKET)
MYMENSINGH DIST.
REFERENCES
ROADS
BLOCK BORDERS
BLOCK H.QS.
DISPENSARIES
SMALLPOX OUTBREAKS 1975
SMALLPOX OUTBREAKS 1974
SMALLPOX OUTBREAKS 1973
1
2
3
OUT BREAKS REPORTED AT W.M.
WEEKLY MARKET SELECTED FOR SEARCH